

[MHE201] DESIGN, CALCULATION AND VERIFICATION OF MACHINES

GENERAL INFORMATION

Studies	UNIVERSITY MASTER IN INDUSTRIAL ENGINEERING	Subject	?
Semester	2	Course	1
Character	COMPULSORY	Mention / Field of specialisation	
Plan	2022	Modality	Face-to-face
Credits	5,5	Hours/week	4.64
		Language	CASTELLANO/EUSKARA
		Total hours	83.5 class hours + 54 non-class hours = 137.5 total hours

PROFESSORS

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REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
MATERIAL ELASTICITY AND STRENGTH	<i>(No previous knowledge required)</i>
GRAPHIC EXPRESSION II	
MACHINE AND MECHANISM THEORY	
[!] FISICA I	

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
MHRA03 - To design and perform machine tests		x		3,9
MHRA22 - To demonstrate knowledge and capabilities to carry out verification and control of facilities, processes and products		x		0,52
MHRA23 - To demonstrate knowledge and capabilities to carry out certifications, audits, verifications, tests and reports		x		0,52
MHRA27 - To demonstrate the ability to integrate knowledge and face the complexity of formulating judgments based on information that, being incomplete or limited, includes reflections on the social, health and safety, environmental, economic and industrial implications and responsibilities		x		0,08
MHRA28 - To communicate your conclusions and the knowledge and ultimate reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way		x		0,08
MHRA30 - To work with people, involving and directing them in a dynamic aimed at a common objective that includes reflection on their ethical and social responsibility, with a global vision of the work to be carried out and the characteristics that it requires (quality, deadlines,...), assuming responsibility for the decisions made		x		0,08
MHR126 - To apply the knowledge acquired and your problem-solving skills in new, little-known or changing environments within broader (or multidisciplinary) contexts related to your area of study		x		0,16
MHR129 - To possess the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous		x		0,16
Total:				5,5

KC: Knowledge or Content / SK: Skills / AB: Abilities

ENAE LEARNING RESULTS

ENAE LEARNING RESULTS	ECTS
ENA123 - Knowledge and comprehension: Deep knowledge and comprehension of mathematics and other basic sciences inherent in their engineering speciality, allowing them to achieve the other competencies of the degree.	0,5
ENA124 - Knowledge and comprehension: Deep knowledge and comprehension of the engineering disciplines of their speciality, at the level necessary to acquire the rest of the competencies of the degree.	0,5
ENA126 - Knowledge and comprehension: Critical knowledge of the broad multidisciplinary context of engineering and the interrelations existing between the knowledge of the different fields.	0,5
ENA128 - Analysis in engineering: Ability to conceive new products, processes, and systems.	0,7
ENA134 - Research and innovation: Ability to carry out bibliographic searches and consult and use databases and other information sources with discretion, in order to carry out simulations with the aim of conducting research on complex topics of their speciality.	0,5
ENA136 - Research and innovation: High-level capacity and ability to project and carry out experimental investigations, interpret data with criteria, and draw conclusions.	0,6
ENA139 - Practical application of engineering: Practical skills, such as the use of computer tools to solve complex problems, carry out complex engineering projects, and design and guide complex investigations.	0,6
ENA140 - Practical application of engineering: Complete knowledge of application of materials, equipment and tools, engineering technology and processes, and their limitations.	0,6
ENA142 - Practical application of engineering: Knowledge and comprehension of the social, health and safety, environmental, economic and industrial implications of engineering practice.	0,5
ENA147 - Communication and Teamwork: Ability to operate effectively in domestic contexts as a member or leader of a team, which may be composed of people of different disciplines and levels, and who can use virtual communication tools.	0,5

SECONDARY LEARNING RESULTS

RMH124 [!] *Dimensiona mecanismos de transmisión de movimiento en base a levas y en base a engranes*

LEARNING ACTIVITIES		CH	NCH	TH
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning			15 h.	15 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints		5 h.		5 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects		26 h.		26 h.
Carrying out exercises and solving problems individually and/or in teams		4,5 h.	4,5 h.	9 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS		
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	10%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems		
Individual written and/or oral tests or individual coding/programming tests	90%	Individual written and/or oral tests or individual coding/programming tests		

CH - Class hours: 35,5 h.

NCH - Non-class hours: 19,5 h.

TH - Total hours: 55 h.

RMH125 [!] *Modeliza, ensaya y verifica elementos mecánicos y sistemas de transmisión*

LEARNING ACTIVITIES		CH	NCH	TH
Personal study and flexible development of concepts and subjects using active dynamics, to foster more meaningful learning			15 h.	15 h.
Conducting tests, giving presentations, presenting defences, taking examinations and/or doing checkpoints		5 h.		5 h.
Presentation by the teacher in the classroom, in participatory classes, of concepts and procedures associated with the subjects		26 h.		26 h.
Carrying out exercises and solving problems individually and/or in teams		4,5 h.	4,5 h.	9 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS		
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	10%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems		
Individual written and/or oral tests or individual coding/programming tests	90%	Individual written and/or oral tests or individual coding/programming tests		

CH - Class hours: 35,5 h.

NCH - Non-class hours: 19,5 h.

TH - Total hours: 55 h.

RMH126 [!] *Diseña, calcula y verifica mecanismos de transmisión de movimiento en máquinas partiendo de las especificaciones dadas*

LEARNING ACTIVITIES		CH	NCH	TH
Development and writing of records, reports, presentations, audiovisual material, etc. on projects/work experience/challenges/case studies/experimental investigations carried out individually and/or in teams			7,5 h.	7,5 h.
Carrying out/resolving projects/challenges/cases, etc. to provide solutions to problems in		7,5 h.	7,5 h.	15 h.

interdisciplinary contexts, real and/or simulated, individually and/or in teams		
Carrying out work experience in real environments and writing the corresponding report	5 h.	5 h.
EVALUATION SYSTEM	W	MAKE-UP MECHANISMS
Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems	50%	Reports on the completion of exercises, case studies, computer exercises, simulation exercises, laboratory exercises, term projects, challenges and problems
Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems	50%	Presentation and defence of exercises, case studies, computer practical work, simulation practical work, laboratory practical work, term projects, end of degree project, master's thesis, challenges and problems
CH - Class hours: 12,5 h. NCH - Non-class hours: 15 h. TH - Total hours: 27,5 h.		

CONTENTS

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Subject notes	"Diseño de máquinas", Robert L. norton, Editorial pearson
Technical articles	"Diseño en Ingeniería mecánica", J. E. Shigley; Editorial McGraw-Hill
Moodle Platform	"Mechanisms design. Analysis and Synthesis", Vol. I, A. G. Erdman, G. N. sandor, Ed. prentice Hall International
Class presentations	"Elementos de máquinas", B. J. hamrock, B. Jacobson, S. R. Schmid, Ed. McGraw-Hill
Lab practical training	"Elementos de máquina", Decker, Ed, Urmo
Specific Master Software	"134 Problemas de teoría de máquinas y mecanismos", P. R. Moliner, CPDA-ETSEIB
	norma ISO 6336, "calculation of load capacity of spur and helical gears"
	"traité théorique et pratique des engrenages", Georges Henriot, Ed. Dunod
	"Engranajes", José Campabadal martí, Ed. Ariel
	"Engranajes", P. R. Moliner, CPDA-ETSEIB
	"Cam design handbook", Harold A. Rothbart, Ed, McGraw-Hill
	"Cam Design", Clyde H. Moon, Camco
	Montaje, Ajuste y Verificación de elementos de máquinas", joseph Schröck, Editorial Reverte
	"Elementos de máquinas"; G. Niemann; Editorial LABOR
	"Manufacturing processes and equipment", George Tlusty, Prentice Hall, 1999